DWeb Weekend 2025 - Saturday 8/16/2025

Roundtable Discussion 1.1

Title: *P2P system architecture and terminology*
Time: *11:15 - 12:00*
Attendees: Matt, Duke, Day
Note taker: Matt

Please add your /initials/ at the front of a comment

General Notes

5 components
routing
naming
discovery
sync
persistence/ephemerality

naming/identifying
public key generation is permissionless with no risk of namespace collission because of the hardness of replicating a private key

because public keys are not human easily readable, keys are often mapped to a human-readable namespace

naming can be done through a single authority (ICANN) or a decentralized system with encoded rules (ENS)

we covered the notion of pluralism and polycentrism in a naming paradigm to a good degree

we established that polycentrism is desirable and context is what allows for this

(as namespace colissions have to be resolved from the user-side in absence of an authority to prevent namespace colission)

users should have complete context (information trail) about the name they are resolving

rendezvous/bootstrap problem
in p2p systems, a peer must initially locate other peers. To do so they utilize a list of hard-coded bootstrap nodes and then can find additional peers from there

this is a point of control/failure/fragility in the network, can we do better?

it was identified that the point to point communication structure of tcp/ip is to blame here, the indvidual rays create a star topology in the network as connections emerge

what is needed is a form of true broadcast, in which a user takes in ambient information readily available from their physical environment and can use this to connect to initial peer(s)

this form of communication doesn't require a connection to any peer (or anyone) and can support an unbounded number of users

examples
-ble
-lora
-ham

openrelay satellites were also mentioned, while not exactly true broadcast they do fulfill some other desirable properties

for further investigation of ble network viability, we can examine Apple's Airtags to see a network currently running in the wild

persistence in p2p networks
we discussed striping and sharding, in which a data set would be striped to provide a m of n failure rate parameter and then the set separated among nodes

in the network which store a portion of the set

the network can be self healing, with erasure coding and regular sampling, the network itself can know what data should be replicated again

the issue of nodes providing faulty information was discussed

Summary to be reported to the other DWeb Weekend participants

a)

b)

c)

name of the reporter